CLAIMS

I claim:

1. A method, comprising:

forming an optical via in a printed circuit board to access an optical fiber embedded in the printed circuit board;

placing an optical redirector within the optical via; and

adjusting the optical redirector to redirect light directed into the optical via so that the light is coupled into the optical fiber.

2. The method of claim 1, wherein forming an optical via comprises forming a well in matrix material of the printed circuit board.

3. The method of claim 2, wherein forming an optical via further comprises forming a light blocking layer on at least part of side walls of the well to prevent at least some light from entering the matrix material of the printed circuit board as the light travels along the optical via.

4. The method of claim 1, further comprising depositing optically neutral material within the optical via and around the optical redirector.

5. The method of claim 4, further comprising forming a light guide to direct light through the optically neutral material along the optical via.

6. The method of claim 1, wherein forming an optical via comprises:

forming a first well in matrix material of the printed circuit board;

depositing a light blocking material on side walls of the first well; and

forming a second well in matrix material of the printed circuit board, the second well having a depth greater than the first well and exposing light transmissive surfaces of the optical fiber.

7. The method of claim 1, wherein when the optical redirector is placed within the optical via it is attached to the printed circuit board with an adjustable attachment material.

8. The method of claim 7 wherein adjusting the optical redirector comprises:

directing light from a source into the optical via to the light redirector;

redirecting, by the optical redirector, the light from the source;

detecting, with a light detector, light from the source that has traveled along the optical fiber after being redirected by the optical redirector;

measuring the detected light; and

changing the position of the optical redirector.

9. A device, comprising:

a surface;

a matrix material;

an embedded optical fiber;

an optical via for allowing light to travel through the matrix material between the surface and the embedded optical fiber; and

an optical redirector for redirecting light received from the optical fiber along the optical via toward the surface of the device and for redirecting light received from the optical via into the optical fiber.

10. The device of claim 9, wherein the optical via comprises side walls that define a boundary between the matrix material and the optical via.

11. The device of claim 10, further comprising a layer of light blocking material covering at least part of the side walls to prevent at least some light from entering the matrix material as the light travels along the optical via.

12. The device of claim 9, further comprising attachment material for attaching the optical redirector to the device.

13. The device of claim 9, further comprising optically neutral material within the optical via and around the optical redirector.

14. The device of claim 13, further comprising a light guide to direct light through the optically neutral material along the optical via.

15. The device of claim 9, further comprising:

a layer of light blocking material covering at least part of side walls that define a boundary between the matrix material and the optical via to prevent at least some light from entering the matrix material as the light travels along the optical via;

attachment material for attaching the optical redirector to the device;

optically neutral material that substantially fills otherwise empty space within the optical via and around the optical redirector; and

a light guide to direct light through the optically neutral material along the optical via.

16. A device, comprising:

a circuit board comprising:

a surface;

a matrix material;

an embedded optical fiber;

a first optical via for allowing light to travel through the matrix material between the surface and the embedded optical fiber;

a second optical via to allow light to travel through the matrix material between the surface and the embedded optical fiber;

a first optical redirector to redirect light received from the optical fiber along the first optical via toward the surface of the device and to redirect light received from the first optical via into the optical fiber; and

a second optical redirector to redirect light received from the optical fiber along the second optical via toward the surface of the device and to redirect light received from the second optical via into the optical fiber; and

a first optical component connected to the circuit board and optically connected to the first optical via to transmit optical signals along the first optical via to the first optical redirector and to receive optical signals that travel up the first optical via from the first optical redirector;

a second optical component connected to the circuit board and optically connected to the second optical via to transmit optical signals along the second optical via to the second optical redirector and to receive optical signals that travel up the second optical via from the second optical redirector.

17. The device of claim 16, wherein optical signals transmitted from the first optical component along the first optical via to the first optical redirector are redirected into the embedded optical fiber to the second optical redirector, which redirects the optical signals up the second optical via to be received by the second optical component.

18. The device of claim 16, wherein the circuit board comprises a plurality of layers and the embedded optical fiber is between a first and a second of the plurality of layers.

19. The device of claim 16, wherein the circuit board comprises at least one layer and the embedded optical fiber is within a first layer.

20. The device of claim 16, wherein:

the matrix material includes a layer with a plurality of woven structural fibers; and

the embedded optical fiber is woven with the structural fibers to form the layer.